

Name: _____

at1119paper: Complete the Square, $b = \text{odd}$ (v519)

Example

By completing the square, find both solutions to the given equation:

$$x^2 - 35x = -264$$

Add $\left(\frac{-35}{2}\right)^2$, which equals $\frac{1225}{4}$, to both sides of the equation.

$$x^2 - 35x + \frac{1225}{4} = \frac{169}{4}$$

Factor the left side.

$$\left(x + \frac{-35}{2}\right)^2 = \frac{169}{4}$$

Undo the squaring.

$$\begin{aligned} x + \frac{-35}{2} &= \frac{-13}{2} \\ x &= \frac{35 - 13}{2} \\ x &= 11 \end{aligned}$$

or
or
or

$$\begin{aligned} x + \frac{-35}{2} &= \frac{13}{2} \\ x &= \frac{35 + 13}{2} \\ x &= 24 \end{aligned}$$

Question 1

By completing the square, find both solutions to the given equation:

$$x^2 + 23x = 78$$

$$\begin{aligned} x^2 + 23x + \frac{529}{4} &= \frac{841}{4} \\ \left(x + \frac{23}{2}\right)^2 &= \frac{841}{4} \end{aligned}$$

$$\begin{aligned} x + \frac{23}{2} &= \frac{-29}{2} \\ x &= \frac{-23 - 29}{2} \\ x &= -26 \end{aligned}$$

or
or
or

$$\begin{aligned} x + \frac{23}{2} &= \frac{29}{2} \\ x &= \frac{-23 + 29}{2} \\ x &= 3 \end{aligned}$$

Question 2

By completing the square, find both solutions to the given equation:

$$x^2 - 25x = 1034$$

$$x^2 - 25x + \frac{625}{4} = \frac{4761}{4}$$
$$\left(x + \frac{-25}{2}\right)^2 = \frac{4761}{4}$$

$$x + \frac{-25}{2} = \frac{-69}{2}$$
$$x = \frac{25 - 69}{2}$$
$$x = -22$$

or
or
or

$$x + \frac{-25}{2} = \frac{69}{2}$$
$$x = \frac{25 + 69}{2}$$
$$x = 47$$

Question 3

By completing the square, find both solutions to the given equation:

$$x^2 + 5x = 66$$

$$x^2 + 5x + \frac{25}{4} = \frac{289}{4}$$
$$\left(x + \frac{5}{2}\right)^2 = \frac{289}{4}$$

$$x + \frac{5}{2} = \frac{-17}{2}$$
$$x = \frac{-5 - 17}{2}$$
$$x = -11$$

or
or
or

$$x + \frac{5}{2} = \frac{17}{2}$$
$$x = \frac{-5 + 17}{2}$$
$$x = 6$$